WHAT IS CLAIMED IS:

1. An optical fiber device comprising a first optical fiber and a second optical fiber having one end fusion-spliced to one end of said first optical fiber;

wherein said first optical fiber has a first mode field diameter $D_1(L)$ at a position separated by a distance L from a fused point between said first and second optical fibers;

wherein said second optical fiber has a second mode field diameter $D_2(L)$ at a position separated by said distance L from said fused point between said first and second optical fibers;

wherein the minimum value D_{20} of said second mode field diameter is different from the minimum value D_{10} of said first mode field diameter; and

wherein each of the maximum value of the ratio of change in said first mode field diameter $(D_1(L_1)-D_1(L_2))/(L_2-L_1)$ between two points respectively separated by distances L_1 and L_2 ($> L_1$) toward said first optical fiber from said fused point between said first and second optical fibers and the maximum value of the ratio of change in said second mode field diameter $(D_2(L_1)-D_2(L_2))/(L_2-L_1)$ between two points respectively separated by said distances L_1 and L_2 ($> L_1$) toward said second optical fiber from said fused point between said first and second optical fibers is 4.0 μm/nm or less.

2. An optical fiber device according to claim 1, wherein said minimum value D_{10} of said first mode field diameter

and said minimum value D_{20} of said second mode field diameter have a difference of 2 μm or more therebetween.

3. An optical fiber device according to claim 2, wherein said optical fiber device satisfies the following conditions:

$$D_1(L)-D_{10} \leq 0.1\,\mu m \quad \text{(where } L \geq 5\,mm\text{)},$$
$$D_2(L)-D_{20} \leq 0.1\,\mu m \quad \text{(where } L \geq 5\,mm\text{)},$$
$$(D_1(0)-D_1(2))/2 \leq 1.5\,\mu m/mm,$$
$$(D_2(0)-D_2(2))/2 \leq 1.5\,\mu m/mm,$$
$$(D_1(0)-D_1(3))/3 \leq 2.5\,\mu m/mm, \text{ and}$$
$$(D_2(0)-D_2(3))/3 \leq 2.5\,\mu m/mm.$$

4. An optical fiber device according to claim 2, wherein said optical fiber device satisfies the following conditions:

$$D_1(L)-D_{10} \leq 0.1\,\mu m \quad \text{(where } L \geq 5\,mm\text{)},$$
$$D_2(L)-D_{20} \leq 0.1\,\mu m \quad \text{(where } L \geq 5\,mm\text{)},$$
$$(D_1(0)-D_1(2))/2 \leq 1.0\,\mu m/mm, \text{ and}$$
$$(D_2(0)-D_2(2))/2 \leq 1.0\,\mu m/mm.$$

5. An optical fiber device according to claim 2, wherein said optical fiber device satisfies the following conditions:

$$D_1(L)-D_{10} \geq 0.1\,\mu m \quad \text{(where } L \leq 3\,mm\text{), and}$$
$$D_1(L)-D_{10} \leq 0.1\,\mu m \quad \text{(where } L \geq 5\,mm\text{)}.$$

6. An optical fiber device according to claim 1, wherein said minimum value D_{10} of said first mode field diameter and said minimum value D_{20} of said second mode field diameter

have a difference of 2 μm or less therebetween.

7. An optical fiber device according to claim 6, wherein said optical fiber device satisfies the following conditions:

$D_1(L) - D_{10} \leq 0.1\ \mu m$ (where $L \geq 3\ mm$),

$D_2(L) - D_{20} \leq 0.1\ \mu m$ (where $L \geq 3\ mm$),

$(D_1(0) - D_1(1))/1 \leq 1.5\ \mu m/mm$, and

$(D_2(0) - D_2(1))/1 \leq 1.5\ \mu m/mm$.

8. An optical fiber device according to claim 6, wherein said optical fiber device satisfies the following conditions:

$D_1(L) - D_{10} \geq 0.1\ \mu m$ (where $L \leq 1.5\ mm$), and

$D_1(L) - D_{10} \leq 0.1\ \mu m$ (where $L \geq 3.0\ mm$).

9. An optical fiber device according to claim 1, wherein one of said minimum value D_{10} of said first mode field diameter and said minimum value D_{20} of said second mode field diameter is 2 μm or more but 7 μm or less.

10. An optical fiber device according to claim 1, wherein one of said minimum value D_{10} of said first mode field diameter and said minimum value D_{20} of said second mode field diameter is 10 μm or more but 14 μm or less.

11. A method of making the optical fiber device according to claim 1, said method comprising the steps of:

preparing first and second optical fibers yielding respective mode field diameters with a difference of 2 μm or more therebetween;

fusion-splicing one end face of said first optical fiber and one end face of said second optical fiber to each other; and

partly heating said first and second optical fibers, after said first and second optical fibers are fusion-spliced, such that the highest and lowest temperatures in a region having a length of 4 mm centered at a fused point between said first and second optical fibers yield a difference of 100°C or less therebetween.

12. A method according to claim 11, wherein said first and second optical fibers are partly heated, after said first and second optical fibers are fusion-spliced, such that the highest temperature is attained at a position separated by 1.0 mm or less from said fused point between said first and second optical fibers toward at least one of said first and second optical fibers.

13. A method according to claim 11, wherein said region including said fused point between said first and second optical fibers is heated with a flame formed by supplying a flammable gas and an oxygen gas to a micro torch.

14. A method according to claim 11, wherein said region including said fused point between said first and second optical fibers is heated with an electric heater.

15. A method of making the optical fiber device according to claim 1, said method comprising the steps of:

preparing first and second optical fibers yielding

respective mode field diameters with a difference of 2 μm or less therebetween;

fusion-splicing one end face of said first optical fiber and one end face of said second optical fiber to each other; and

partly heating said first and second optical fibers, after said first and second optical fibers are fusion-spliced, such that the highest and lowest temperatures in a region having a length of 2 mm centered at a fused point between said first and second optical fibers yield a difference of 100°C or less therebetween.

16. A method according to claim 15, wherein said first and second optical fibers are partly heated, after said first and second optical fibers are fusion-spliced, such that the highest temperature is attained at a position separated by 0.5 mm or less from said fused point between said first and second optical fibers toward at least one of said first and second optical fibers.

17. A method according to claim 15, wherein said region including said fused point between said first and second optical fibers is heated with a flame formed by supplying a flammable gas and an oxygen gas to a micro torch.

18. A method according to claim 15, wherein said region including said fused point between said first and second optical fibers is heated with an electric heater.